Brief

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Flat Free Tire Sealant Study

Introduction

MoDOT Maintenance Operations frequently have problems with flat tires due to punctures while mowing on our state right-of-way. This causes production down time and expense for tire repair. In addition to tire punctures, there have been problems with porosity leaks when equipment sits idle for several months at a time.

In the past, using tire sealants were not user friendly when tire repairs were necessary. Most tire repair shops would not repair tires with sealant in the tire or they would charge extra to clean up the mess caused from the sealant.

Research Approach

MoDOT Maintenance and General Services business units contacted Research, Development and Technology to study the Flat Free Tire Sealant product. This product advertises protection against puncture leaks as well as porosity leaks. They also claim their product cleans up with water, which makes it user friendly with tire repair shops.

Two different size tractors were used in this study. The first was a smaller lead tractor, John Deer 5310 equipped with sickle bar mower. This tractor mainly runs on the shoulder to cut grass adjacent to the pavement. Nails and broken glass are examples of hazards encountered by this tractor. The next tractor, John Deer 6410 was larger and pulled a "Batwing" brush hog mower. This tractor is used in ditches and median mowing. Debris lying in the tall grass often punctures these tires.

In order to evaluate the Flat Free product, it was agreed to place the product into the tires of the two MoDOT tractors for the duration of one mowing season to determine if the product would reduce the amount of flat tires normally encountered. The John Deer 5310 had 12.2 x 24 front tires and 16.9 x 30 rear tires and the John Deer 6410 had 12.6 x 28 front tires and 16.9 x 38 rear tires. Each tire was filled with the manufacturer's suggested amount of Flat Free Tire Sealant.

Results

During the 2001 mowing season (May – September) only two flats were experienced. Both were on the John Deer 5310. One rear tire was damaged when

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the sidewall of the tire came into contact with the end of a culvert pipe. The tire was cut and damaged beyond repair. The second incident occurred one morning when a front tire was low. The tire was aired-up and hasn't failed since. These two tractors did not encounter any other tire failures for the remainder of the mowing season.

The cost of the Flat Free product ranges between $0.11 and $0.13 per ounce. The manufacturer provides an application rate chart for the proper amounts of product to add to the appropriate tire size. For example, the amount of product needed for the twenty-eight inch tractor tire was 160 ounces. The thirty-eight inch tractor tire required 170 ounces. Using an average of $0.12 per ounce, this equates to $19.20 for each twenty-eight inch tire and $20.40 for each thirty-eight inch tire.

The cost of the product to outfit the John Deer 5310 was approximately $70 and the cost for the John Deer 6410 was approximately $80.

From past experience, maintenance would have expected to have ten or more flat repairs during the mowing season for these two pieces of equipment at a cost of $40 for a service call and approximately $40 per flat. The result of this study shows a cost savings using the Flat Free Tire Sealant for the two tractors was estimated to be $550. This was calculated from using $150 for the cost of the sealant compared to $800 for ten flats at $80 for the service calls and flat repair.

Furthermore, when the tire repair shop replaced the rear tire that was cut, they had no objection working with the tire sealant as far as clean up and user friendliness.

Implementation

Research, Development and Technology recommends the statewide use of Flat Free in all of our tractor or mower air-filled rubber tire equipment that is susceptible to punctures and porosity leaks. Research will continue to monitor this product through out the implementation of Flat Free Tire Sealant.

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